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FAKULTA INFORMAČNÍCH TECHNOLOGIÍ  
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FACULTY OF INFORMATION TECHNOLOGY  
DEPARTMENT OF COMPUTER SYSTEMS

## BUSINESS CARD GENERATOR

BAKALÁŘSKÁ PRÁCE

BACHELOR'S THESIS

AUTOR PRÁCE

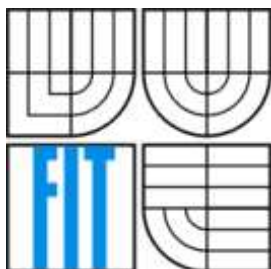
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## GENERÁTOR VIZITEK

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## **Abstrakt**

Vizitky jsou i dnes důležitou součástí komunikace. Použití vizitky je jednoduchý způsob pro sdílení základních kontaktních informací. V této práci jsou popsány základní vlastnosti vizitek. Dále se práce zabývá tvorbou webové aplikace pro generování vizitek. Výsledkem aplikace je PDF soubor s navrženými vizitkami.

## **Abstract**

Even nowadays, business cards are a very important part of communication. Using business cards is an easy way to share basic contact information. In this thesis the elementary properties of business cards are described. The thesis deals with the creation of a Web application for generating business cards. The result of the application is a PDF file with designed business cards.

## **Klíčová slova**

Vizitka, elektronická vizitka, webová aplikace, grafické rozhraní, generování PDF dokumentu

## **Keywords**

Business Card, Electronic Business Card, Web Application, Graphical Interface, Generating of PDF Document

## **Citace**

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# **Business Card Generator**

## **Prohlášení**

Prohlašuji, že jsem tuto bakalářskou práci vypracoval samostatně pod vedením pana Ing. Petra Chudého, Ph.D. MBA. Uvedl jsem všechny literární prameny a publikace, ze kterých jsem čerpal.

.....  
Martin Krippel

15. 5. 2014

## **Poděkování**

Chtěl bych se poděkovat vedoucímu mé bakalářské práce pánu Ing. Petru Chudému, Ph.D., MBA, za jeho odborné rady, které mě věnoval.

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Tato práce vznikla jako školní dílo na Vysokém učení technickém v Brně, Fakultě informačních technologií. Práce je chráněna autorským zákonem a její užití bez udělení oprávnění autorem je nezákonné, s výjimkou zákonem definovaných případů.

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# 1 Introduction

The business card is a very important part of communication and presentation. Even nowadays, in the digital age with all the electronic devices, business cards have a great value. They are only small paper cards, but they have a great potential.

One of the many reasons of using business cards is their availability. Besides that, there are still places like hospitals or planes where mobile phones and similar devices should not be used – or cannot be used at all. These are ideal situations for using a simple business card.

In order to gain some information one needs only the ability to read. It is not necessary to use any special software or device. In addition, business cards are incredibly effective. The business card is quite small, so it is not possible to write on it a lot of information. However, quality is more important than quantity. In the business card there are a few lines with the most important information, which one needs to contact the owner of the business card. These are: the name, the telephone number, the e-mail, the Web site - everything one needs to know.

Why use business cards? The answer is: Because the old-fashioned paper rectangle is still the fastest and easiest way to share business contact information with other businesspeople and with prospective customers and clients.

This thesis describes business cards, programs for their creation and my own application for making business cards. The aim of the thesis is to simplify (especially when it comes to the usage) the business card generator.

The second chapter of the thesis is focused on the short history and types of business cards. There is also a description of the format and some information about the contents of the good business card.

The third chapter is aimed on the existing online and offline programs for creating business cards. Further, properties and differences of the programs are discussed.

The fourth chapter describes the visual appearance of the application. There is a description of how the graphic interface should look like. Further, the visual parts of the application are described.

The implementation of the application is explained in Chapter 5. There are programming languages, libraries and techniques which I used. Each language, include the libraries, has a short description and function in my application.



## 2 State of the Art

### 2.1 History

Current business cards have developed from so-called “visiting cards” and “trade cards”. They are an inseparable part of the corporate or person’s presentation [1].

The first “visiting cards” appeared in the fifteenth century in China. In Europe they appeared almost two centuries later. Royal servants or servants of rich families had to bring visiting cards to the host. This act symbolized the arrival of the guests. Visiting cards looked like a carte. Over the course of time, they became an important accessory of elite. These cards had many decorative elements such as ornaments or coats of arms. A piece of information was written in a golden decorative lettering on the card. In the nineteenth century, everyone, who had a higher social status had to have a visiting card. Some houses even had special places in the walls, a specific storage space, where guests could insert their visiting cards.

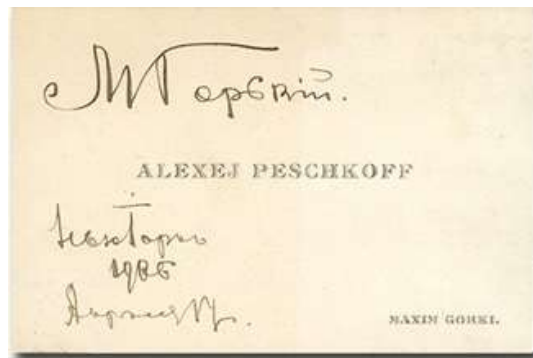


Fig. 1: Visiting Card of Maxim Gorki (1868-1936) [2]

“Trade cards” became very popular in London at the beginning of the seventeenth century. They served for promotion and advertisement, but also as maps showing places, where the businessmen worked. At that time houses were not labelled according to any system (address number or the name of the street). Businessmen used their trade cards as their symbol. That is how the creation of the (for us) more interesting business cards started [2].



Fig. 2: Trade Card of Goldsmith and Engraver [2]

Nowadays, business cards are small paper rectangles. Their size fits exactly in the wallet. The piece of information in the business card has also changed. There should be only a few pieces of necessary information in the business card. The most important of them are: the name, the telephone number, the e-mail, the address.

## 2.2 Types of Business Cards

### 2.2.1 Paper Business Cards

The classic business card is a small paper card. It is landscape-oriented. Thanks to the landscape orientation it is possible to use longer lines on the card. This makes the card much more readable. It is not a mistake when the business card is portrait-oriented. It is a more daring, more creative view. It depends on what function does the card have. The rectangular shape is also not necessary. For example, cards can have rounded corners or a different creative form. It is good to preserve the standard size. The card fits then better in the wallet or in some smaller place when one wants to keep it.

There are several sizes of business cards. It depends on the areas, where cards are used or for whom they are made. The European standard is 90×50 mm. This standard is used in Slovakia and in the Czech Republic too. The next chart 1 shows sizes in different countries (geographical areas) [5].

Tab. 1: Sizes of Business Card

Area of using	Size [mm]
<b>International Standard</b>	86×54
<b>China, Hong Kong, Thailand</b>	90×54
<b>USA, Canada</b>	89×51
<b>Japan</b>	91×51
<b>West Europe</b>	90×55
<b>Australia, North Europe</b>	85×55
<b>European Standard</b>	90×50

The business card should be simple and readable. Too much information on the card is undesirable. It is very important to know which kind of information is necessary. Nowadays, these are probably the most important ones:

- **Logo** – company's representation.
- **First and Last Name** – titles may be added as well. It depends on whether the business card is private or not. In most cases, titles are not used on the private cards. Besides that, titles can be quite problematic. Some of them are written before the name, some of them after the name. There are titles that are used only in some countries. E.g. the title CSc. in Slovakia and the Czech Republic.
- **Position** – this information is mostly on company business cards. It is a position in the company.
- **Telephone Number** – not necessarily only one telephone number. Nowadays, making a phone call is the fastest way of communication.
- **Fax.**
- **E-mail Address.**
- **Address** – It is rather a piece of information for company business cards.

- **Web site** – the link to the Web site with more information.

The visual display of the piece of information is also very important. The proper font has to be chosen. It may look like a trifle, but the wrong choice of the font may destroy the whole graphic design. Fonts are divided to serif and sans-serif. In typography, a serif is a small line attached to the end of a stroke in a letter or a symbol, such as when handwriting is separated into distinct units for a typewriter or a typesetter. The most well-known type of the serif font is *Times New Roman*. The Sans-serif or simply the sans typeface is the one that does not have the small projecting features called "serifs" at the end of strokes. These fonts are graphically easier to display. The most well-known example of a sans-serif font is *Arial*. The appropriate combination is the sans-serif font for titles and the serif font for other kinds of text. (More information is to be found in [6] a [7]).

The colour contrast is also a very important attribute of the good business card. It is the contrast between the font colour and the background colour. Low contrast makes the text unreadable. The painter and scientist Albert Munsell created a special colour circle [8]. From the circle you can determine the contrast between colours. Mr. Munsell sorted colours in the circle by their relations. The colours which are next to each other are harmonic. Contrasting colours are on the opposite sides of the circle. An example of an inappropriate contrast is on the picture 8. In the next picture there is an example of Munsell's circle [7].



Fig. 7: Munsell's circle [39]



Fig. 8: Low Contrast between Text and Background

Generally, business cards are only one-sided. It means that the logo, the text, etc. are only on the front side, but even this is not a rule. On the back side you may insert a picture for a more attractive design or some additional information. The empty space has also its foundation. It is good

to keep some empty space for notes. Everybody can add their own information on the business card. It can be the time of the meeting, another contact or something else. Some people say that an empty place in the business card is a useless wasting of space, because the card is quite small, so the whole space should be used. It is the decision for an individual to make. Both solutions have pros and cons. One should choose what is the best for one's purpose.

## 2.2.2 Electronic Business Cards

**CD Business Card** – (bootable business card, business card CD) Its shape and size are very similar to that of the classic paper business cards. On the front page of the CD business card there is a printed label. The CD business card looks like any other business card - but in fact it is a small CD-R. This business card can be read by CD or DVD drivers. The advantage of this solution is the possibility to provide much more information. For example, the CD business card can contain pictures, videos, HTML pages, presentations etc. [3].



Fig. 3: CD Business Cards [40]

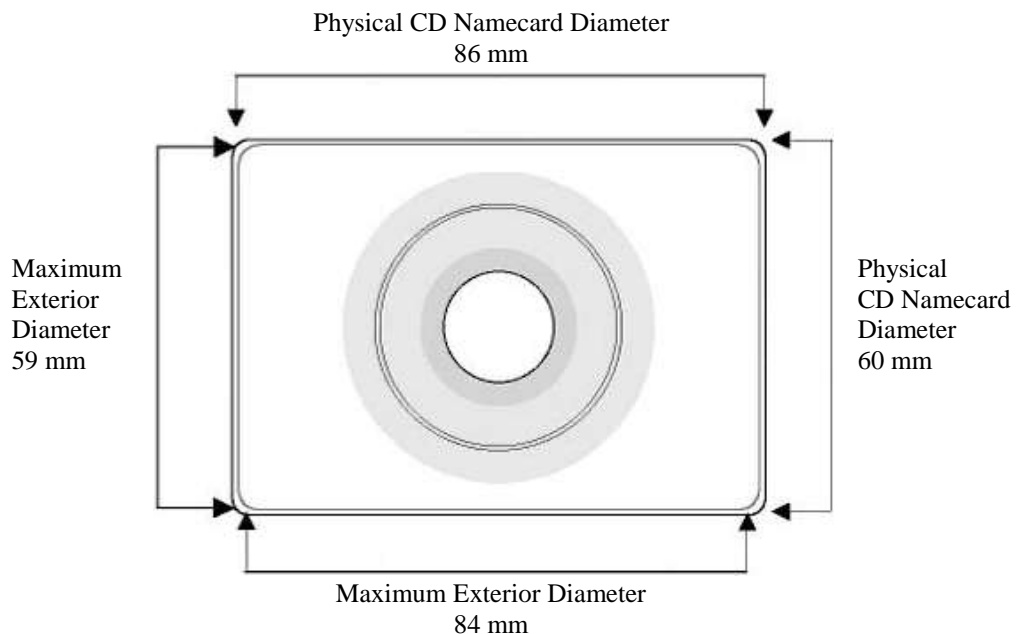


Fig. 4: Parameters of CD Business Card [41]

**vCard** – It is another type of the electronic business card. In most cases it is joined to the e-mail, but it can be on the web pages as well. VCard was developed by the consortium of the companies Apple, IBM and Siemens in 1996. It contains a name, an address, a date, time etc. - and occasionally a logo, a photo, a music clip etc. These are some of the options of what to display in the vCard. In order to view the vCard, the support of the e-mail client is needed. Another option is the online directory which supports the vCard or the vCalendar [4]. MS Outlook supports sending vCards as well.

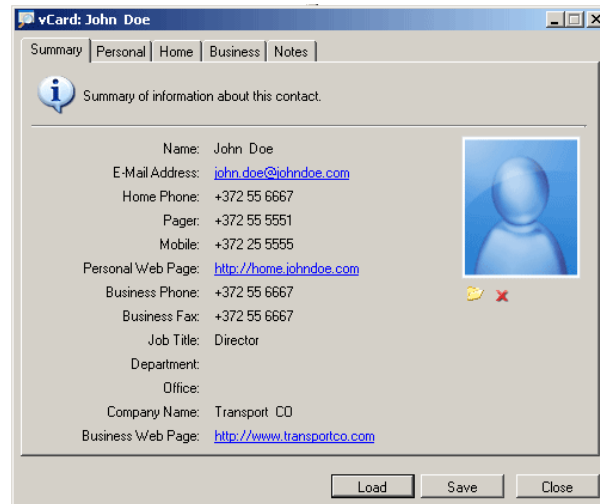


Fig. 5: vCard [42]

**USB Business Card** – It is based on a similar principle as CD business cards. The only difference is that the form of a USB is used instead of a CD. The USB form is better, because the USB form can contain more information than a CD. Another difference is that the owner can save some pieces of his/her own information on the USB business card – and it is rewriteable. So the USB business card is very practical, too.



Fig. 6: USB Business Card [43]

## 2.3 Business Card Editors

In this chapter I would like to describe some existing programs for creating business cards. There are two groups of these kinds of programs. The first group are online programs and the second group are offline programs.

Online business card generators are free. Depending on the generator it is possible to make less or more changes. The already designed visiting card is impossible to download. The cards may only be ordered. The advantage of this process may be the better quality of the print. Some companies offer round corners. It is good, because making such a thing at home could be difficult for those who are not professionals at it. The disadvantage is the fact that you have to wait some time to get the business cards. Fewer of the online programs create a PDF document, which is possible to download. However, these generators have their limitations. For example, they do not support all possible sizes of business cards.

Offline programs have greater functionality. That is not necessarily an advantage. The business card generators are quite complicated. Too many tools for modification make programs too complicated. These applications have the multifunctional user interface. The advantage is that you can print the business card at any time and at any place with a printer available. On the other hand, offline generators are not available in full versions.

### 2.3.1 Online Editors

#### Internet Print

The Web site internetprint.eu [9] offers creation of business cards without any necessity of registration. All tools for modification are in one screen.



Fig. 9: InternetPrint.eu

There are many templates in some categories. However, it is impossible to create a business card with another template than with those in the Web site. The text content is fixed for every template. The text layout is also specific for each template.

The text is inserted by means of text fields and it is not movable. Every line has a fixed position in the card. Unfortunately, the empty text field is also displayed as an empty line. Thus, it

leaves less space for the free use. There is a possibility to print on the back side. There are several options of what could be there: the same template, the QR code or lines of text. This application produces business cards in all standard sizes. This is not a common practice (see chapter 2.2.2 table 1).

As the last step, the customer can choose how many cards he/she wants. Then he/she has to fill in the contact information and wait until the business cards arrive.

## Tisknisi

The Web site [tisknisi.cz/cs/](http://tisknisi.cz/cs/) [10] offers registration, but it is not necessary to register in order to create a business card. The business card may be created from prepared templates or from one's own graphical project.

The process of creating a business card is similar to the previous example. The text can be written into nine text fields. Each text field defines only one line in the business card template. Every line on the pattern is showed by a sample text. For example, the line “*email: email@email.cz*” is displayed while the text field is not filled yet. It is not possible to change the number or the position of the lines on the card. If you want to see how the card looks like without the text, you have to click on the empty field and hit the spacebar. The sample text is not in the final product, but it is a little bit annoying.

When the client brings his/her own business card, it has to be prepared in advance. A graphical software should be used for that purpose. There is a tutorial of how to make a good business card on this Web site. When the graphical design is already completed, it is loaded to the Web site. The Web site supports several formats (jpg, jpeg, png, bmp etc.). It is possible to upload three graphical designs and let a message as well. The last step is to put the mail-order into the shopping cart.

The biggest disadvantage (of this website) is the absence of business card sizes. The size of the card is always 90×50mm. This fact is mentioned on the Web site.



Fig. 10: Facebook Business Card

The most interesting option is “*the facebook business card*” (figure 10). After the customer logs in the Facebook, this tool can make a business card from the timeline, photos and profile



information. It is a very interesting option. The business card can be edited. At the end you have to fill in the information and number of cards and confirm the mail-order.

### **Vizitka cz**

The next similar application is vizitka.cz [11]. Templates are divided to personal and company templates. In fact, it is only an advertising practice. The difference between personal and company business cards is, that there are more text fields in the company business card. It means that there are more text lines in the company business card.

Using one's own graphic in this Web site means only the possibility of inserting a picture on the business card. It is not possible to edit the background of the card and the number or the layout of the lines. The second step is ordering the business cards. It starts with counting the price of the order. The next step is the contact and payment information. There is no option of editing the size of the card.

### **Reptisk**

Reptisk Company [12] offers printing of business cards and some posters. Business cards are printed and sent to the customer. The process of creating business cards has three steps. In the first step the customer fills in the information, e.g. the number of business cards, the size (there are only two options), round corners, laminating sheets, paper quality and time of delivery. In the second step there are more options. One of them is uploading one's own file with graphical design.

The other option is choosing a template. The information is filled in the template. Because in some templates there is a fixed text, it is necessary to fill in all the fields. The changes on the pattern can be seen by clicking on the button "View".

In the last option customers can design the card themselves. In the Web site there is an online editor. This graphical editor has many tools. The main tools are background properties, the card orientation and inserting of elements. The elements are: the text and four types of geometrical shapes. These are a line, a circle, a rectangle and a rectangle with round corners. Each element can be changed by its own panel. The panel contains tools according to the element. Some properties are not very apparent, so some steps may be complicated.

The user can create a fine-looking business card, but there are still a few problems. There is no option to align text. The text layout is already set. It is not possible to align any object. The only way to edit the card is by means of the displayed grid. At the end the user saves his/her project, checks it and puts it in the shopping cart. (Figure 12 of this application is at the end of chapter 3.2)

### **Vizitky 2000**

In the Web site vizitky2000.cz [13] it is possible to choose from four types of business cards. These are personal, company and professional business cards and business cards for administration. Data are on each type of them. It is possible to edit each of the text information with several tools and each tool has a few properties. It depends on the type of tool.

The text information such as a company, a name and an address can be edited by these properties: the type of font, the colour, the alignment, the size, the height of line and the position. The position of the text is not set by dragging the text, but it is set by a precise figure in millimetres. It determines the distance from the top and the left side of the card. The figure may increase or decrease gradually by clicking on the arrow icon (button) or it is possible to set the figure directly by rewriting the number.

It is possible to insert a line on each business card. You can set the line's width, size, colour and position on the card. The line can be set horizontally or vertically.



The background of the card consists of three parts. One of them is for the whole card. The others are moveable. It is possible to set the width and the height of the backgrounds (when their colour is different from the colour of the whole background). On the background there is only colour, (and text entries), not images.

Two of the pre-prepared pictures can be inserted on the card as well. The pictures are from spheres like sport, food, flowers, computers, electronics, etc. It is possible to set the position and the size of the picture.

The process of the business card creation ends with placing a logo of a company on the business card. On the template there is a grey rectangle representing a real logo. In this case it is possible to set the size and position of the logo as well. The logo has to be sent by mail, e-mail or FTP.

In this Web site it is necessary to register to buy or save the business card. This site has a lot of tools for each element (of the business card). However, the setting of the elements is very complicated and unpractical. When editing some elements, clicking on the upper arrow decreases the figures, while it should actually increase them.

Fig. 11: Editor of Vizitky2000.cz

## DeGraeve

In this Web site [14] there is an online business card generator in English language. The author of the Web site, Steven DeGraeve enables users download the PDF file with their visiting cards.

This is a very simple generator. The template layout cannot be changed. The logo layout is oriented to the left. It can be uploaded from the user's computer by clicking on the button "logo". The changes in the business card are visible after clicking on the button "preview".

There is only one size of the business cards. It is 3,5x2 inch (+/- 89x51mm). The PDF is generated on the paper which size is that of a standard "letter" size.

## Business Card Land

The Business Card Land [15] is another business card generator which generates PDF files for downloading. The business card is created in a few simple steps.

The first step is choosing a template. There are several categories of templates. The second step is the format of the card. It can be either the International Standard or the American Standard. In this step the type of paper ("letter" or "A4") is to be chosen as well. In the third step the text information is to be filled in simply by ticking and clicking on the text fields. The last but one step is the colour. It is possible to change the colour of the background, font or template.

The last step is creating the PDF file. There are two opportunities. It is possible either to print one business card on one page or ten (eight if you like) business cards on one page. After this step it is possible to generate the PDF file.



Fig. 12: The Graphical Editor of Reptisk

## 2.3.2 Offline Editors

### Formix SE

It is a computer program made by Martin Roubec [16]. It is not specified only for creating business cards. There are a lot of templates for many types of documents, for example a DVD cover, complaint, a bill of exchange, a firearm licence etc. - and of course templates for business cards. The free TRIAL version is limited up to fifty initiations. The TRIAL version is not fully functional.

This application contains several templates. Templates can be created or changed, but only in the full version. The particular elements are edited after using the button “*proposal of form*”. On the left side of the workplace there is a menu, through which the elements can be edited.

With the button “*New Element*” a new element is added. The new elements are a picture, a title, a border and it is even possible to add one’s own elements. It is not possible to print the created business card, because it is not possible to print the background and all over the card there is the text “*DEMOVERSION*”.

The program interface is complicated. One reason for that is the fact that the program is not only for generating business cards. This program is not an ideal option for creating business cards.

### Business Card Designer Plus

The Business card designer plus [17] is a product of the CAM Development Company. The program is designated especially for the creating of business cards. It is not free, but there is a TRIAL version with the limited period of fifteen days.

The process of creation is guided. The guide is in a form of a few windows, in which elements like templates, data, the logo, the background and the font are edited step by step. When the guidance is finished, the business card is displayed on the workplace. In this program it is possible to change almost all of the information. A new text or geometrical objects can be inserted. Each of the elements can be marked. After that the menu of the element is displayed next to the business card.

The interface is good. There are lots of opportunities for changes. Nevertheless, the whole process of creation is unnecessarily complicated. In the TRIAL version the business cards can be saved only in the internal format “.bcp”. It is not possible to transfer the card designed in this computer programme. However, the card can be printed.

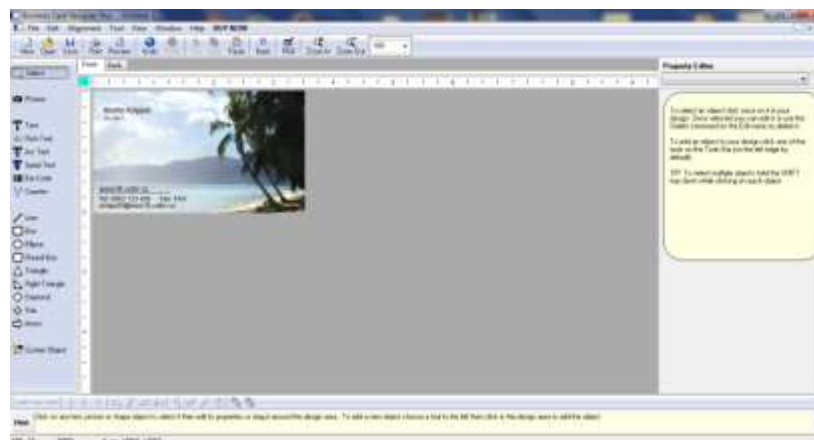


Fig. 13: Business Card Designer Plus

### 3 Graphic Design

There were several methods of user interfaces during the time of developing this kind of applications. The main and still used features of graphic interface arose at the end of 1970s/early 1980s. User interfaces can be divided into 3 types: Command Line Interface (CLI), Text User Interface (TUI) and Graphical User Interface (GUI). Here is a short characteristic of them. More information can be found on [18] [19] [20]. Types of user interfaces are shown in table 2.

Tab. 2: Types of User Interfaces

Type of UI	Description	Advantages	Disadvantages
CLI	<ul style="list-style-type: none"><li>• communication by commands</li><li>• keyboard control</li></ul>	<ul style="list-style-type: none"><li>• uniqueness and universal</li></ul>	<ul style="list-style-type: none"><li>• difficult to learn</li><li>• inappropriate for beginners</li></ul>
TUI	<ul style="list-style-type: none"><li>• interstage between CLI and GUI</li><li>• uses only text, symbols and colours available for a given text environment</li></ul>	<ul style="list-style-type: none"><li>• like GUIs, use the entire screen area and accept mouse input</li></ul>	<ul style="list-style-type: none"><li>• not suitable for application which makes graphical elements</li></ul>
GUI	<ul style="list-style-type: none"><li>• allows users to interact through graphical elements</li><li>• uses windows, menu, icons</li></ul>	<ul style="list-style-type: none"><li>• using of mouse</li><li>• user friendly</li></ul>	<ul style="list-style-type: none"><li>• more difficult implementation of bigger programs</li></ul>

Today the most common graphic interface is so-called “WIMP”. WIMP stands for "windows, icons, menus, pointer", denoting a style of interaction using these elements of the user interface. It was coined by Merzouga Wilberts in 1980. Other expansions are sometimes used, substituting "mouse" and "mice" or "pull-down menu" and "pointing", for menus and pointer, respectively. Though the term has fallen into disuse, some use it incorrectly as an approximate synonym for graphical user interface. Any interface that uses graphics can be called a GUI, and WIMP systems derive from such systems. However, while all WIMP systems use graphics as a key element (the icon and pointer elements), and therefore are GUIs, the reverse is not true. Some GUIs are not based in windows, icons, menus, and pointers. For example, most mobile phones represent actions as icons, and some may have menus, but very few include a pointer or run programs in a window [21].

#### 3.1 Web Application

Confusing Web applications and Web sites is as easy as confusing user interface design and Web site design. Nevertheless, they are different both in essence and in so many other ways, which are going to be explored in this article. A Web site is a collection of pages consisting mostly of a static content, images and video, with limited interactive functionality (i.e. except for the contact form and search functionality). The primary role of a Web site is to inform. Some Web sites use content management systems to render dynamic content, but their nature is still informational. Web applications, on the other hand, are dynamic, interactive systems that help businesses perform business critical tasks and that increase and measure their productivity. Thus, the primary role of a Web application is to perform a function that serves the user’s tasks according to defined business rules.

GUI of a Web application is only a little bit different than a desktop user interface. It should follow the rules which every application should have. Here are some principles of the visual organization of elements. More information is to be found in [22].

- **Balance** – an element in the window should be evenly distributed.

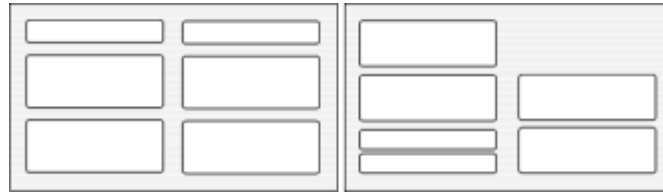


Fig. 14: Balance (left), Unbalance (right) [22]

- **Symmetry** – groups of elements should be the same or very similar on left and also on the right side.



Fig. 15: Symmetry (left), Asymmetry (right) [22]

- **Regularity** – the size, colour, shape and distance of the same elements should be uniform everywhere, where it is possible.



Fig. 16: Regularity (left), Irregularity (right) [22]

- **Predictability** – in each window of the application there should be the same organization of style and logic.



Fig. 17: Predictability (left), Unpredictability (right) [22]

- **Sequence** – elements should be distributed according to the logic of the problem.
- **Economy** – using simple style (Fig. 18).
- **Unity** – using of same shape, size and colour for the elements with the same meaning (Fig. 19).

- **Proportion** – controls are distributed with an emphasis on the whole.
- **Simplicity** – a window should have an appropriate number of elements.
- **Grouping** – It is useful to group elements logically according to their style and meaning.

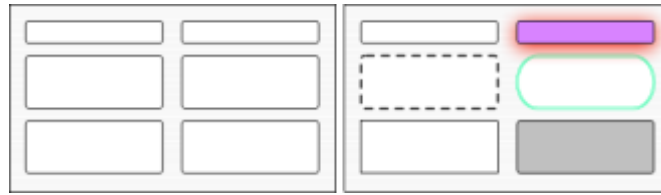


Fig. 18: Economy (left), Pointless display, Inhomogeneity, Inexpedience (right) [22]



Fig. 19: Unity (left), Fragmentation (right) [22]

## 3.2 Application Design

I tried to use some of the principles I described in the previous subhead. In the next Table 3 there is a description of the HTML form elements, which can be found in my application. More information is to be found in [24] [25].

Tab. 3: HTML Form Elements

Element	Short description	Usage
<b>Text Field</b>	<ul style="list-style-type: none"> <li>• one-line input field</li> <li>• the size can be set in HTML</li> <li>• value can be tested only with script (for example Javascript)</li> </ul>	<ul style="list-style-type: none"> <li>• name, simple text</li> <li>• contact information</li> </ul>
<b>Radio Button</b>	<ul style="list-style-type: none"> <li>• let a user select ONLY ONE of a limited number of choices</li> <li>• not necessarily controls value</li> </ul>	<ul style="list-style-type: none"> <li>• one choice from multiple values</li> <li>• yes/no, small/middle/big</li> </ul>
<b>Select Menu</b>	<ul style="list-style-type: none"> <li>• used for creating a drop-down list</li> </ul>	<ul style="list-style-type: none"> <li>• choose from many values</li> </ul>
<b>File</b>	<ul style="list-style-type: none"> <li>• file-select field and a "Browse..." button (for file uploads)</li> <li>• Use the accepted attribute to define the types of files that the control can select</li> </ul>	<ul style="list-style-type: none"> <li>• uploading files to server</li> </ul>
<b>Submit</b>	<ul style="list-style-type: none"> <li>• is used to send form data to a server</li> </ul>	<ul style="list-style-type: none"> <li>• to send form data to server</li> </ul>

Graphical user interface is divided into four main parts. These are: text fields, the business card surface, options for business card changes and templates. Since in our republic the texts are read from left to right, I put text fields to the left side of the application. Next to them there is an area, where it is possible to create one's own business card. The area is in the middle. It is the most important part

of the application. The size of this area changes according to the format of a business card. Texts, logos and templates (background of the business card) are displayed there as well.

On the right side there are options, which can change business card properties. The first two of them are two buttons – “*Input Logo*” and “*Output Logo*”. Under them there are other options. I wanted to display the whole application in one window without scrolling. So, the options are in accordion widget (more in Chapter 5). For each property a different graphical element is needed (their properties are described in Tab. 3). An ideal option for the choice of a business card size is the radio button, because it enables users to choose only one size, although there are 7 of them. Colours (text and background) are chosen by means of the colour picker. It is a very simple way of selecting colours. Select menus are the best options for choosing the size and fonts. Also, it is possible to choose only one value. Nevertheless, there are more values then the number of business card sizes, so I have decided for select menus. For texts align I used standard pictures – left/right alignment and centre. The last option, PDF, is not directly for business cards. There are two values for the size of the paper of a PDF document and two values for the number of business cards per one page. The last element is a submitting button for creation of a PDF file.

The fourth part of the application is for creating templates. It is situated as the lower part of the application. This is an area of pictures (prepared in advance), which can be used as the background on the business card. The first two pictures are not the real templates. There is a “button” for uploading (removing) customer template.



Fig. 20: Visual Appearance of the Application

## 4 Implementation

Based on the analysis in the Chapter 3 I found out, that many online programs are quite limited. The biggest limitation is in the output format and the support of standard business card sizes. This analysis was a basis for goals, which I defined for my work.

- **Resize Business Card** – The size of a business card depends on the area, where the business card is used. The application should enable to resize format of the business card. The business card formats are listed in Chapter 2 in Table 1.
- **Inputting Text** – It is necessary to have a text in business cards. I intended text fields to be movable and not just fixed in some position. Moreover, the text should be without unnecessary spaces between the lines. The possibility of changing the font, font size and font colour is a necessity.

**Uploading Customer Graphic** – A lot of business cards contain a logo. Because of that, the application should have a possibility of uploading pictures. The most common picture formats on the Web are JPG, PNG and GIF. The logo must be movable, too. The second type of graphic, which can be uploaded by customers, is the business card background. Again, it is possible to upload a picture as a background. However, it is not moveable, because it is on the whole card.

- **Generate PDF document** – This requirement is based on instructions, but I had to propose a format of the document. The “A4” format is very common in the world. However, the USA, Canada and Mexico have their own standards. The “*letter*” is a similar format to our “A4” [26]. Those three countries make a big part of the world, so the application should support both formats. The maximum number of generated business card per page is ten. However, it would be annoying to print ten cards and then find out that something is wrong. The application should print only one business card per page as a means of check.

In my application I used HTML, CSS, JavaScript, PHP and Ajax. HTML, CSS and Javascript work on the client’s side and PHP generates PDF document on the server side from HTML form data. Ajax is used for uploading pictures.

### 4.1 HTML and CSS

HTML is a markup language. It is intended to create Web pages and to display other information in Web browsers. HTML is oriented more on a structure of information than the semantic of words. The specification of HTML language is maintained by the World Wide Web Consortium (W3C) [27]. The newest version of HTML is called HTML5 [28].

CSS is a language for describing the presentation of Web pages. The main purpose of CSS is to allow designers a separate look on a document from the point of its structure and content. CSS is independent from HTML and can be used with any XML-based markup language. The separation of HTML from CSS makes it easier to create and maintain Web sites [29] [30].

HTML Web page is a base for my application. There are two HTML pages, one for Slovak language and the other for English language. HTML pages are connected with CSS file `StyleSheet.css`. This file describes the visual appearance of the application. The pages are linked with JavaScript file and its library jQuery as well. The visual appearance of the application in the figure 20. The appearance is described in the previous Chapter 4.2.



Because of the differences between Web browsers, they can display the information in various ways. A good example of this is fonts. Each browser can support different fonts. There is a group of fonts which is supported by all major browsers. This group is called “*Web safe fonts*” [23].

## 4.2 JavaScript and jQuery

JavaScript is a dynamic computer programming language. It is most commonly used as part of web browsers, whose implementations allow client-side scripts to interact with the user, control the browser, communicate asynchronously, and alter the document content that is displayed. JavaScript is a prototype-based scripting language. Its syntax was influenced by C. JavaScript copies many names and naming conventions from Java, but the two languages are otherwise unrelated and have very different semantics. It is a language which supports object-oriented, imperative, and functional programming styles [31].

jQuery is a fast, small, and feature-rich JavaScript library. It makes things like HTML document traversal and manipulation, event handling, animation, and Ajax much simpler with an easy-to-use API that works across a multitude of browsers. With a combination of versatility and extensibility, jQuery has changed the way that millions of people write JavaScript [32]. The biggest advantage of jQuery is the ability of choosing elements from DOM. It works similarly as CSS selectors, but it has more options. jQuery is able to add some HTML element a proper reaction for an action. For example, by clicking on the picture “*Custom template*”, jQuery opens a dialog window. JavaScript cannot do this. An HTML element must have an attribute for the given action and the value of this parameter is a JavaScript function. Next reason for using jQuery is the fact, that jQuery works in the Web browser in the same way. There are some differences between Web browsers. JavaScript can operate differently regarding which one of them is being used. I found a problem there: the same parameter of an HTML element is not on the same position in various Web browsers. jQuery can choose the wanted value directly.

jQuery is accompanied with jQuery UI (user interface) [34]. jQuery UI is a curated set of user interface interactions, effects, widgets, and themes built on top of the jQuery JavaScript Library [34]. jQuery UI offers many objects of user interface, like the dialog window, menu, the progress bar. In my implementation I used the dialog window and the accordion widget. The dialog window is opened when a user wants to upload a logo or a template. Images are loaded with Ajax technology (more information in [37]). When an image is uploaded to the server, jQuery adds the image in the business card.

The second jQuery UI element I mentioned is the accordion widget. The widget shows only one part and the other parts are hidden. It spares a lot of place and it is also very simple. My accordion has five parts. jQuery UI has its own CSS framework. I did not modify the appearance of the accordion. For the reasons of uniformity I edited style of the input fields and buttons according to the style of jQuery UI.

It is possible to choose colours with the colour picker. I decided to use jQuery plug-in – Farbtastic Color Picker. Farbtastic is a jQuery plug-in that can add one or more colour picker widgets into a page through JavaScript. Each widget is then linked to an existing element (e.g. a text field) and will update the element's value when a colour is selected [33]. This colour picker is used twice in my application (for font colour and background colour). The colour picker is simple, but very intuitive.

Positioning of a text and of a logo on a business card is specified by distance in millimetres, although this kind of information (position, width, distance) is given in pixels and has to be converted (by the programme itself). Every device (the monitor of a notebook, a printer or a library

for generating PDF document) can have a different resolution. It was necessary to use so-called absolute units (cm, mm, in, pt and pc). I used the next formula for converting px to mm [38].

$$mm = \frac{px * 25.4}{DPI}$$

Formula for Converting Pixels to Millimeters

A DPI monitor value (the monitor of a specific user) is gained from a special invisible area with width and height one inch.

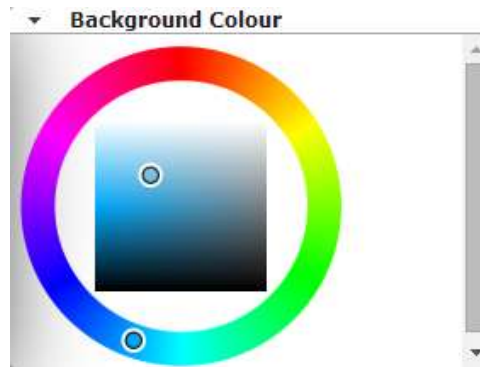


Fig. 21: Farbtastic Color Picker

## 4.3 PHP and DOMPdf

PHP (PHP Hypertext Preprocessor) is a widely-used, open source scripting language. PHP scripts are executed on the server [35]. I created three- quite small- scripts. Two of them are for uploading images and the third is for generating a PDF document.

The simplest way to generate a PDF document is from an HTML site. There are many opportunities to convert HTML to PDF, not only with PHP, but I chose PHP. From existing libraries for converting HTML to PDF (like mPdf, DOMPdf) I chose DOMPdf. As it is evident, DOMPdf is an HTML to PDF converter. At its heart, DOMPdf is (mostly) CSS 2.1 compliant HTML layout and rendering engine written in PHP. It is a style-driven renderer: it will download and read external stylesheets, inline style tags, and the style attributes of individual HTML elements. It also supports most presentational HTML attributes [36].

The process of generating seems to be quite simple. All user interaction is in fact just filling in of a form. When the user submits the form, all important information is sent to the server. The server creates HTML according to the gained information. Then the server makes a new PDF object with DOMPdf library, sets paper size and number of business cards per page and generates the PDF document. The Web browser offers an option of saving the document - and the process of creating a business card is completed.

## 5 Testing and Evaluation

The application was tested on four major Web browsers. These were: Firefox, Google Chrome, Opera and Internet Explorer. All of them were in their latest version (as per May 5th). The application is displayed correctly in all of these Web browsers. There are small differences like shapes and colours of some elements (for example a different look of the radio buttons). Nevertheless, the differences are not important for the final appearance of the application. Functionality is also correct in all mentioned Web browsers. Again, JavaScript works in each Web browser slightly differently. These differences are solved - more or less - with JQuery.

The application was tested by a few users. Their results and reactions were quite good. They worked with my application correctly. None of them had any difficult problem with orientation on the site or with editing/creating business cards.

## 6 Conclusion

The aim of this bachelor thesis was to create a Web application for generating business cards. The application should preserve typographic rules of a business card. One part of the thesis was to recognize these rules. In this thesis I briefly described origin and history of business cards. Then I analyzed online and offline generators of business cards and compared them.

After the analysis of the business card typography and existing programs I proposed my own application. I tried to create an easy application with more functionality than other existing free applications. The application offers all standard formats of business cards. It allows users to set optional position of a text and a logo. Furthermore, the application supports customer graphic. There is an opportunity to print business cards on two standard paper sizes (A4 and letter).

Although I completed my application, there are still some things which could be improved in the future. In my application there are only eleven templates. Creating more templates can make the application more interesting. Next improvement should be the registration of users. They could save their business cards and then they could change them or improve them. More possibilities of generating a PDF document could be added, like a choice of more paper formats or number of business cards per page.

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# Appendix A

## CD Content

Inserted CD contains these files and folders:

- folder `application` – it contains all files and folders of the application
- folder `thesis` – it contains `.docx` file of my thesis
- file `bachelor_thesis.pdf` – technical report in PDF document



# **Appendix B**

## **Result of the Application**

Examples of PDF files which are generated by my application – Business Card Generator.



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